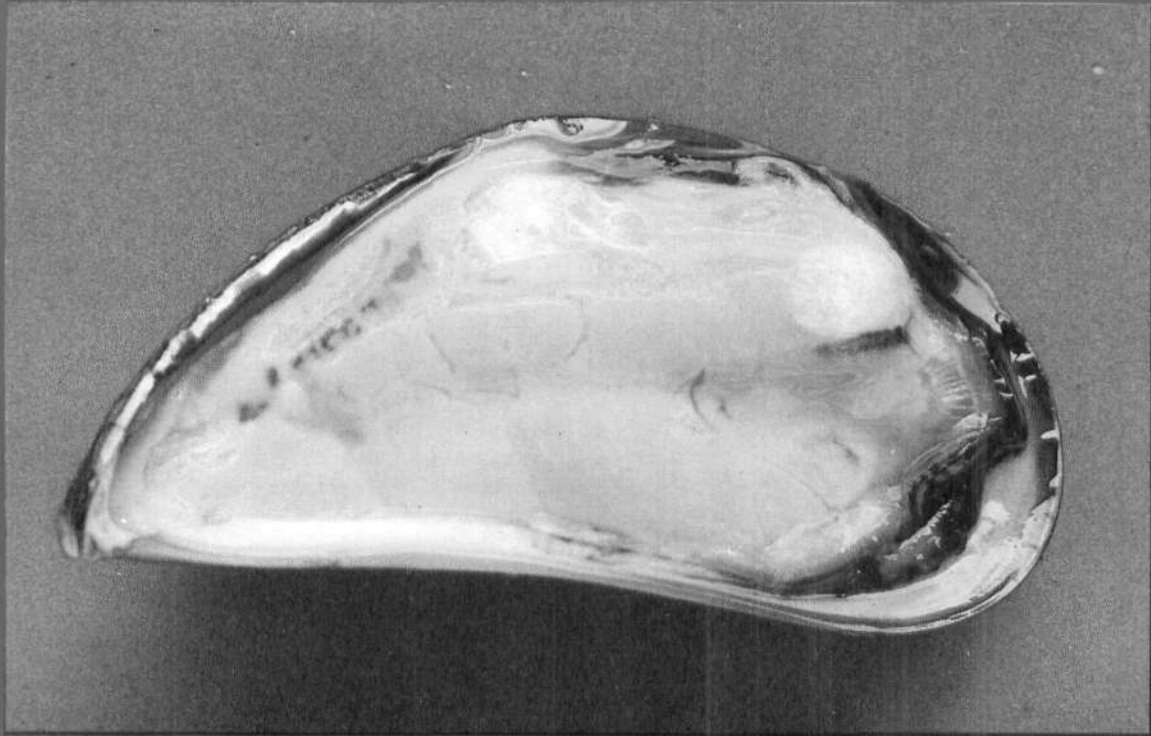




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केन्द्रीय समुद्री मात्स्यकी अनुसंधान संस्थान कोचिन, भारत CENTRAL MARINE FISHERIES RESEARCH INSTITUTE COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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Spiny lobsters are a low volume high value crustacean resource exploited from the seas around India. Almost the entire catch is exported in various forms such as chilled, whole cooked and in live form, earning nearly Rs. 55 crores annually. Lobsters are widely distributed along the Indian coasts in habitats ranging from rocky to muddy to coral reefs. Eight species of spiny lobsters are known to be distributed along the Indian coasts of which six inhabit depths ranging from 1-70 m and the other two are deep dwelling forms (250-400 m). Among the six inshore species, only three are fished in commercial quantities and the other three occur in small quantities in certain pockets. Apart from the spiny lobsters, a single species of scyllarid lobster, *Thenus orientalis* also form fairly good fishery on the northwest and southeast coasts.

In India, 76% of the lobster catch is by trawlers and the rest is by indigenous gear operated by traditional fishermen. Although lesser in magnitude, a large proportion of coastal fishermen depends on the resource for their livelihood. With the increasing demand for live lobsters in the international market, exploitation of lobsters has increased dramatically in recent years resulting in declining catches. Unaware of the implications of uncontrolled exploitation, lobsters of all sizes are caught and marketed and fishermen have started feeling the pinch of the vanishing lobster resource. Major traditional lobster fishing grounds are located on the southwest and the southeast coasts, extending

from Trivandrum to Cape Comorin and from there to Madras. However, small-scale fisheries in different pockets along the coast also contribute to the total lobster catch.

Tikkoti situated about 40 km north of Calicut is known for lobster fishing for decades. In 1950's and 1960's a type of cast net known as 'Muru vala' with a mesh size of 4.5-6.0 cm made of hemp twine was mainly used for lobster fishing. In addition to this net, bottom-set-gillnet was also used. Currently, fishermen use only bottom-set-gillnet for lobster fishing. Nets are carried to the fishing grounds in dug-out canoes in the evening and spread around the rocks at depths varying from 10-15 m. On the following day morning the nets are taken out and examined for lobsters entangled in the net. After removing the lobsters, the nets are set again in the same ground. Occasionally, the nets are brought to the shore for cleaning, mending and drying. The lobsters are sold to a local dealer for price ranging from Rs.150-300, depending on the grade (weight). The present note reports on the catch, species composition and biological characteristics of major species landed at Tikkoti during 1994-'97.

Fishery

Normally, lobster fishery at Tikkoti begins in September or October, after complete withdrawal of the southwest monsoon and continues up to April or May. The estimated annual landings of lobsters during 1994-'95, 1995-'96 and 1996-'97 were 2,256 kg, 2340 kg and 534

kg, respectively (Table 1). Landings declined sharply from 2,340 kg in 1995-'96 to 534 kg in 1996-'97. The CPUE also reduced substantially from 1.61 kg in 1995-'96 to 0.52 kg in 1996-'97. In 1994-'95, the estimated monthly landing fluctuated from 80 kg in September to a peak of 448 kg in December. In 1995-'96, the estimated catch varied from 140 kg in December to the maximum catch of 447 kg in April. In 1996-'97, except for a good landing of 300 kg in April, the catches were generally poor. There were no landings in December, January and February.

Catch composition

Three species of spiny lobsters constituted the lobster fishery at Tikkoti (Table 2). *Panulirus homarus* is the dominant species forming an average 74% of the total catch followed by *P. Polyphagus* (20%) and *P. ornatus* (6%). A small quantity of *P. versicolor* was landed in February 1995-'96. Few numbers of this species was noticed in the landings from 1995-'96 onwards. Occurrence of *P. versicolor* is reported for the first time from the Malabar coast. Normally, in the beginning of the fishery in September, *P. homarus* appears first followed by *P. polyphagus* and *P. ornatus* in December or January. However, in 1996-'97 both *P. homarus* and *P. polyphagus* appeared in October and *P. ornatus* entered the fishery only in April. The contribution of *P. ornatus* to the commercial fishery is insignificant as this species formed only 6% of the total catch. *P. polyphagus* catch declined from 568 kg (25%) in 1994-'95 to 367 kg (16%) in 1995-'96 and was further reduced to a mere 90 kg in 1996-'97. On the other hand, catches of *P. homarus* improved from 1,594 kg in 1994-'95 to 1,777 kg in 1995-'96. However, landings of *P. homarus* declined drastically from 1,777 kg in 1995-'96 to 416 kg in 1996-'97.

Size distribution

In *P. homarus*, the size of lobsters ranged between 41-100 mm carapace length (CL) in males with maximum numbers in the size range of 71-80 mm CL in 1994-'95, 51-60 mm CL in 1995-'96 and 61-70 mm CL in 1996-'97. In fe-

males also the size varied from 41-100 mm CL with maximum numbers in the size range of 61-70 mm CL in 1994-'95, 61-70 and 71-80 mm CL in 1995-'96 and 61-70 mm CL in 1996-'97 (Fig. 1-3). Considering the three year period, 37% of the males and 47% of the females were in the size range of 61-70 mm CL. Juveniles constituted only 6.7% of the total catch. In *P. polyphagus*, the size of males ranged between 51 and 110 mm CL with maximum numbers in the size ranges of 71-80 mm CL and 81-90 mm CL. In females, the size varied from 61-100 mm CL with the dominant sizes in the length range of 81-90 mm CL. In *P. homarus*, the males were predominant constituting 60%, whereas in *P. polyphagus*, males and females were in equal proportions.

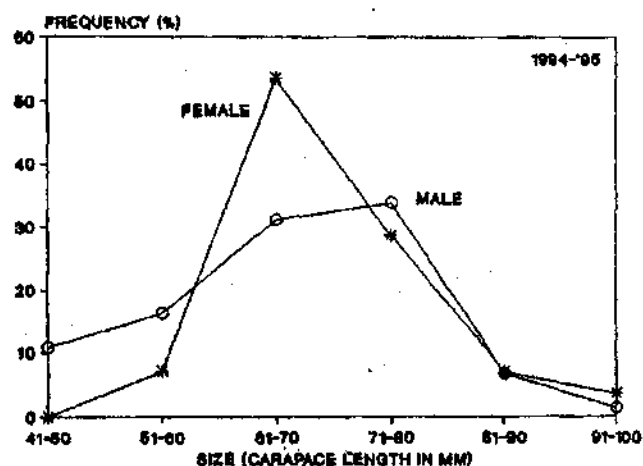


Fig. 1. Size frequency distribution of spiny lobsters in the gillnet catches at Tikkoti, during 1994-'95.

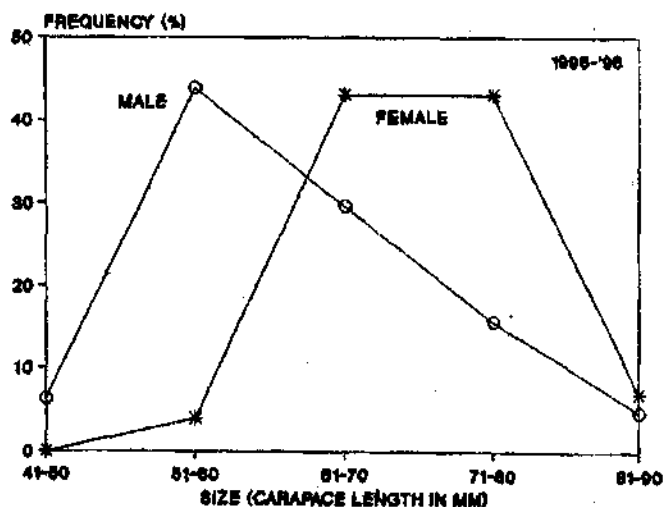


Fig. 2. Size frequency distribution of spiny lobsters in the gillnet catches at Tikkoti during 1996-'97.

TABLE 1. Estimated catch (kg), effort and catch per unit effort lobsters landed at Tikkoti during 1994-'97

Months	1994-'95			1995-'96			1996-'97		
	Effort (E)	Catch (C)	C/E	Effort (E)	Catch (C)	C/E	Effort (E)	Catch (C)	C/E
April				129	447	3.47	274	300	1.10
May				109	118	1.08	124	46.5	0.38
June									
July									
August									
September	120	80	0.66						
October	155	236	1.52	248	384	1.55	155	55.8	0.36
November	150	330	2.20	310	300	0.97	315	45.9	0.15
December	186	448	2.41	270	140	0.52			
January	248	382	1.54	270	310	1.15			
February	232	372	1.60	271	346	1.28			
March	310	408	1.32	279	278	1.00	155	85.3	0.55
Total	1,401	2,256	1.61	1,886	2,340	1.24	1,023	534	0.52

TABLE 2. Catch composition of spiny lobsters landed at Tikkoti (tn kg) during 1994-'97

Month	1994-'95			1995-'96						1996-'97											
	P.homa-rus	%		P.poly-phagus	%	P.orna-tus	%	P.homa-rus	%	P.poly-phagus	%	P.orna-tus	%	P.versi-color	P.homa-rus	%	P.poly-phagus	%	P.orna-tus	%	
Apr.	-	-	-	-	-	-	-	-	-	312	70	23	5	-	-	240	80	45	15	15	5
May	-	-	-	-	-	-	-	-	-	-	-	33	22	-	-	33	72	-	-	13	28
Jun.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jul.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sep.	80	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oct.	236	100	-	-	-	-	384	100	-	-	-	-	-	-	37	66	19	44	-	-	-
Nov.	330	100	-	-	-	-	300	100	-	-	-	-	-	-	40	87	6	13	-	-	-
Dec.	331	69	83	19	54	12	140	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Jan.	248	65	134	35	-	-	271	87	15	5	24	8	-	-	-	-	-	-	-	-	-
Feb.	231	62	121	33	20	5	255	70	16	4	75	21	17	5	-	-	-	-	-	-	-
Mar.	158	39	230	56	20	5	197	71	24	9	57	21	-	-	66	77	20	33	-	-	-
Total	1,594	71	568	25	94	4	1,777	76	367	16	179	7	17	1	416	78	90	17	28	5	

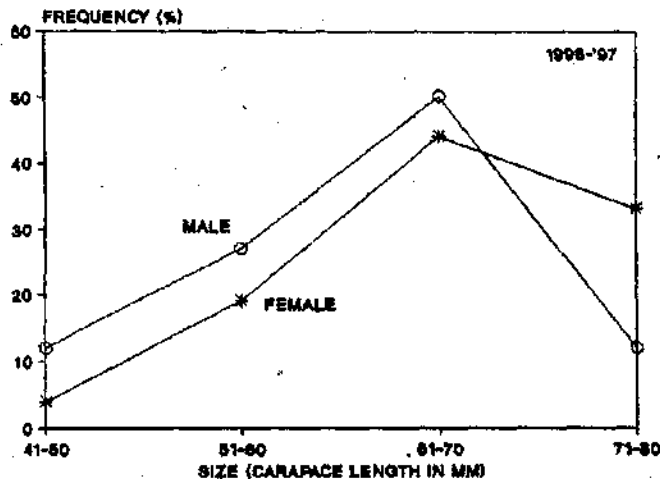


Fig. 3. Size frequency distribution of spiny lobsters in the gillnet catches at Tikkoti during 1996-'97.

Breeding season

In *P. homarus*, maximum number of berried lobsters were observed in February (44%) and March (91%) and evidently these two months are the peak breeding period for the species. Berried lobsters were noticed in December, January and April also but their frequency was less in these months. Interestingly, 95% of the berried lobsters were devoid of spermatophoric mass on the ternal plate. It is likely that the sperm mass would have lost while scrubbing during oviposition. In *P. polyphagus*, spermatophoric mass was noticed in few females during February and berried females were rarely

encountered in the catch. No breeding activity was observed in *P. ornatus* as the fishery is constituted by lobsters below the mature size. *P. polyphagus* and *P. ornatus* are known to breed in deeper waters unlike the spiny lobster *P. homarus*.

General remarks

The spiny lobster fishery at Tikkoti though lesser in magnitude is important from the fishery point of view. The traditional fishermen living in three adjacent villages of Kodikal, Kadaloor and Tikkoti are engaged in lobster fishing for the past five decades. The total landings have declined over the years but sudden fall in catches as is seen in 1996-'97 may probably due to natural fluctuations in environmental conditions and change in current pattern rather than due to overfishing. In 1960's fishing was restricted to only three months from August to October and now the fishing begins in September or October and continues upto April or May. Unlike the southwest and southeast coasts where lobster fishing activity has increased severalfold due to pressure from the export market, there is no substantial increase in effort at Tikkoti. Establishment of artificial reefs may help in enhancement of lobster population and therefore increase in catches and more revenue for the fishermen.